

ECOsysteM Spaceborne Thermal Radiometer Experiment on Space Station



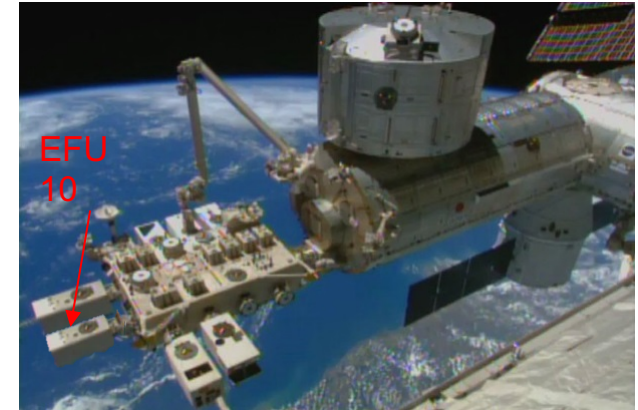
Mission Overview

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Salient Features

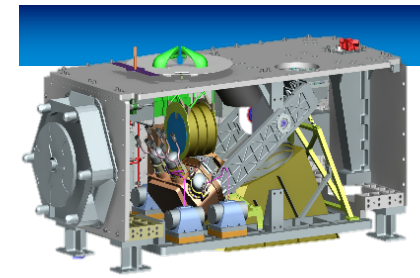
- Category: 3
- Risk Class: D
- 8–12.5 μm radiometer with a 400km swath, 69 x 38 m resolution
- Measure brightness temperatures of Earth at selected locations
- Deployed on the ISS on JEM-EFU 10
- Operational life: 1 year after 6 weeks on-orbit checkout



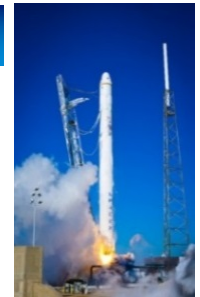
ISS JEM-EF

Science

- ECOSTRESS will provide critical insight into plant-water dynamics and how ecosystems change with climate via high spatiotemporal resolution thermal infrared radiometer measurements of evapotranspiration (ET) from the International Space Station (ISS)
- ECOSTRESS will:
 - Identify critical thresholds of water use and water stress in key climate-sensitive biomes
 - Detect the timing, location, and predictive factors leading to plant water uptake decline and/or cessation over the diurnal cycle
 - Determine agricultural water consumptive use over the contiguous United States (CONUS) at spatiotemporal scales applicable to improve drought estimation accuracy



ECOSTRESS



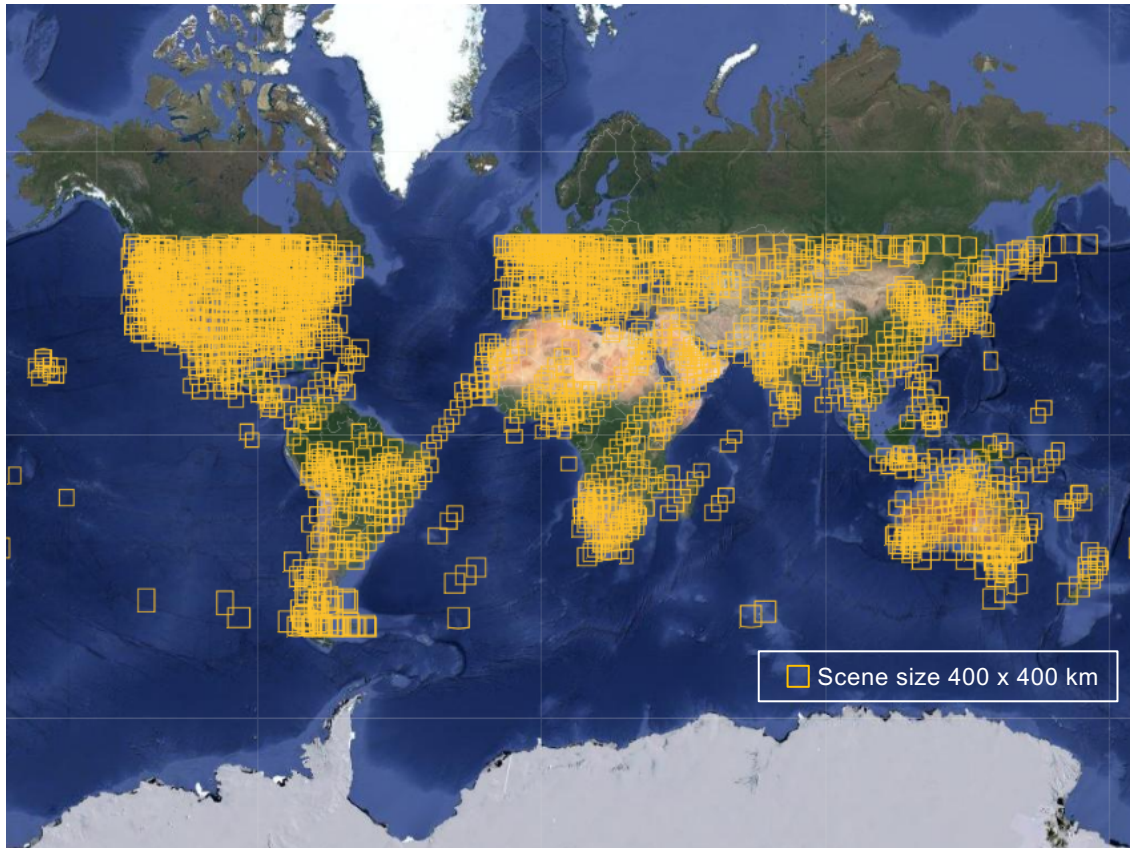
Falcon-9

Mission Summary

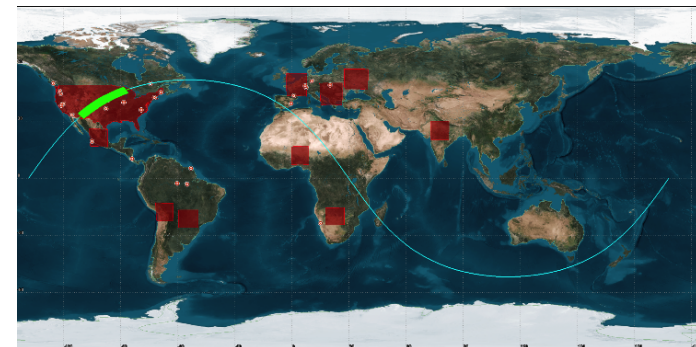
- The payload was launched from KSC aboard a SpaceX Falcon-9 rocket on June 29, 2018
- The robotic transfer from the Dragon Trunk to JEM-EFU site 10 occurred on July 5, 2018
- Both events were nominal – no issues
- Held PLAR on August 16th
- IOC handover to Operations team completed
- Started science mission on August 20th
- In total, over 105,000 products (~52 TBs) have been delivered to LP DAAC
- Early Adopter Program initiated early October with 57 registered users.



- Colored areas on map represent **over 4000** ECOSTRESS scenes collected as of September 29, 2018



Baseline

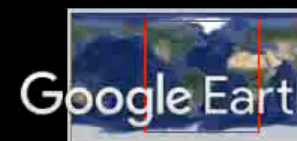




Scenes Collected To-Date



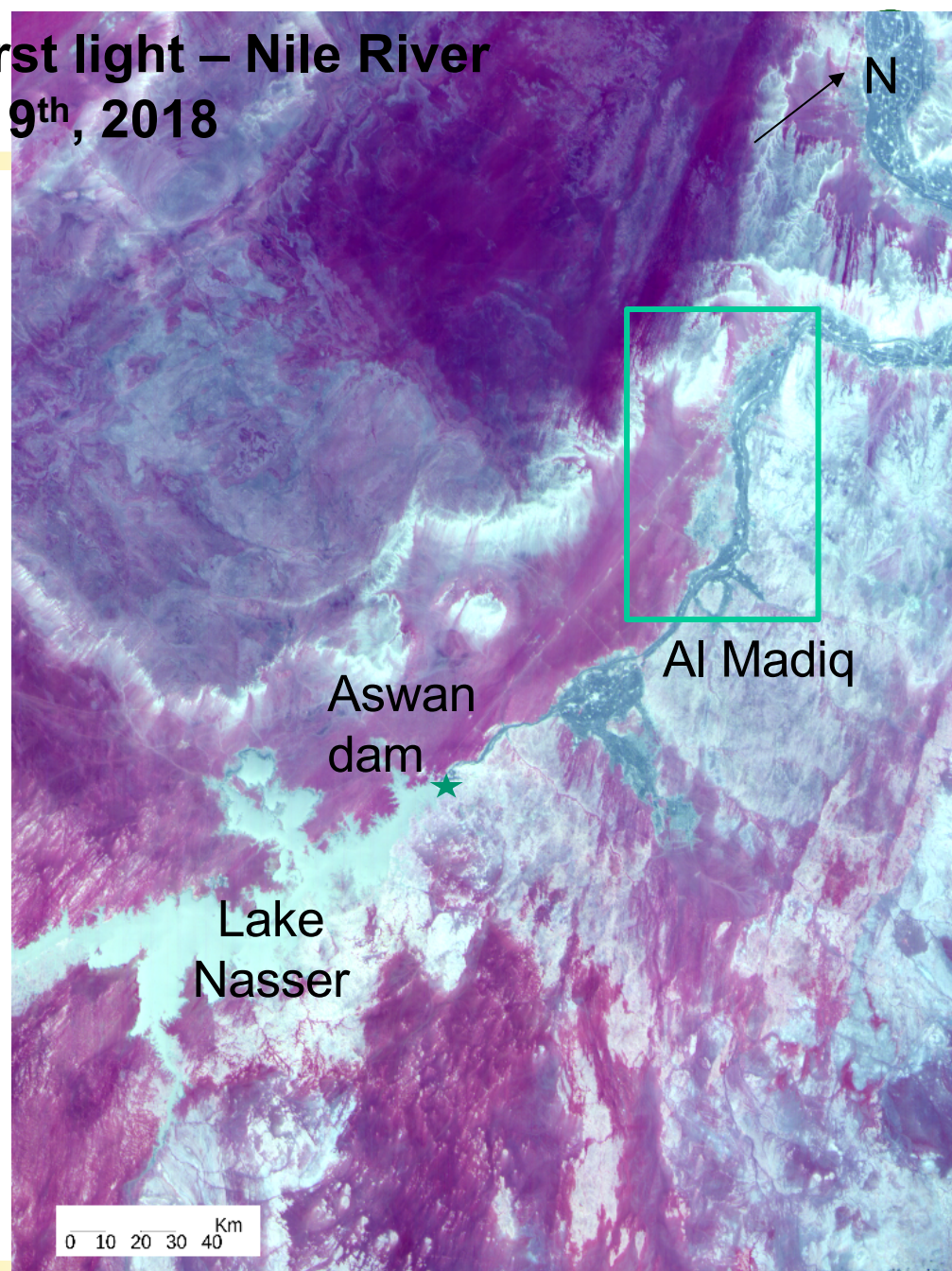
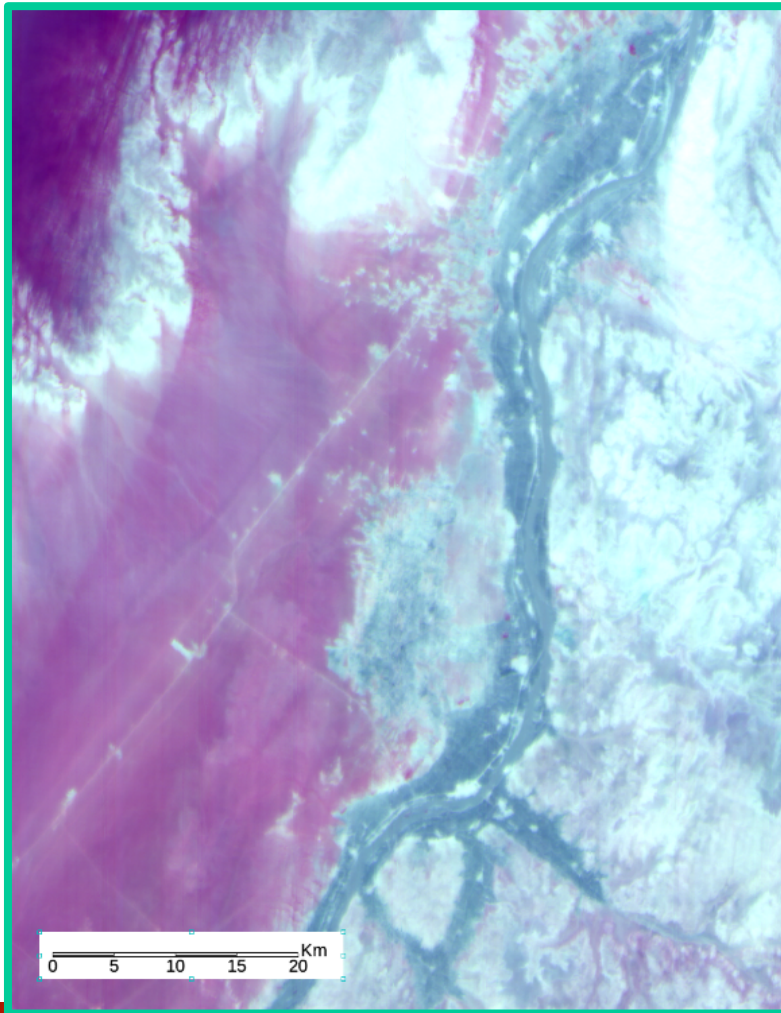
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Image IBCAO





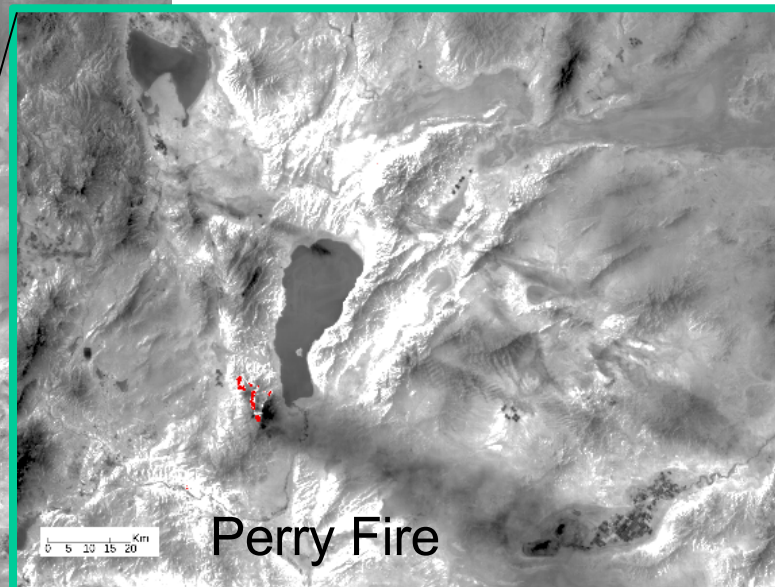
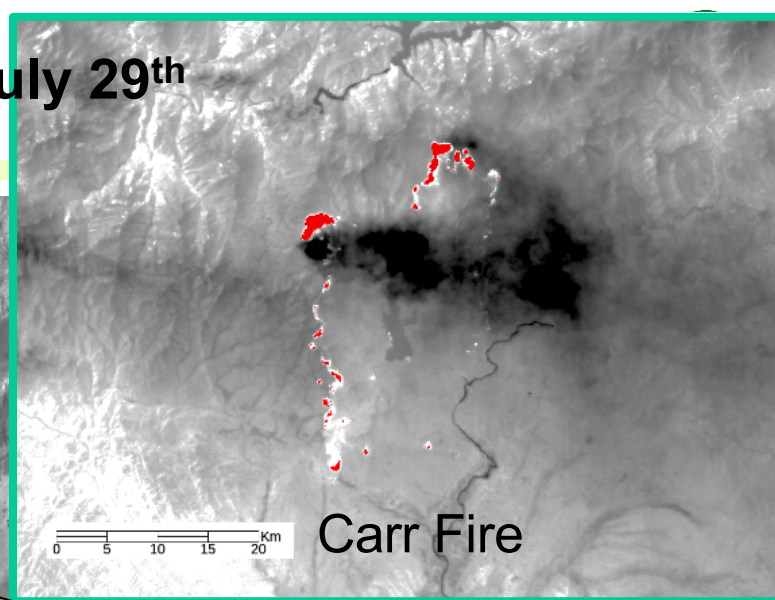
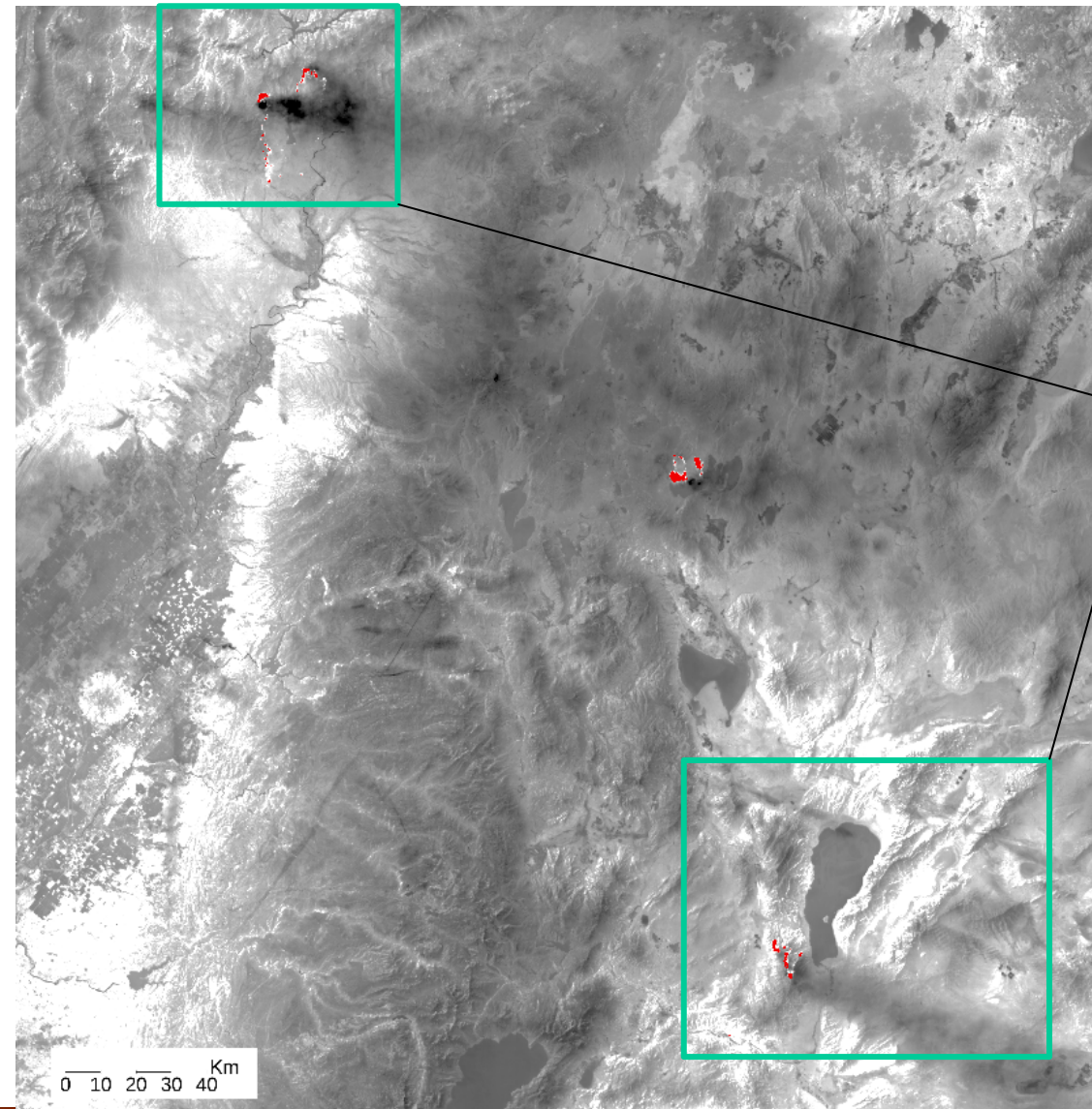
ECOSTRESS first light – Nile River

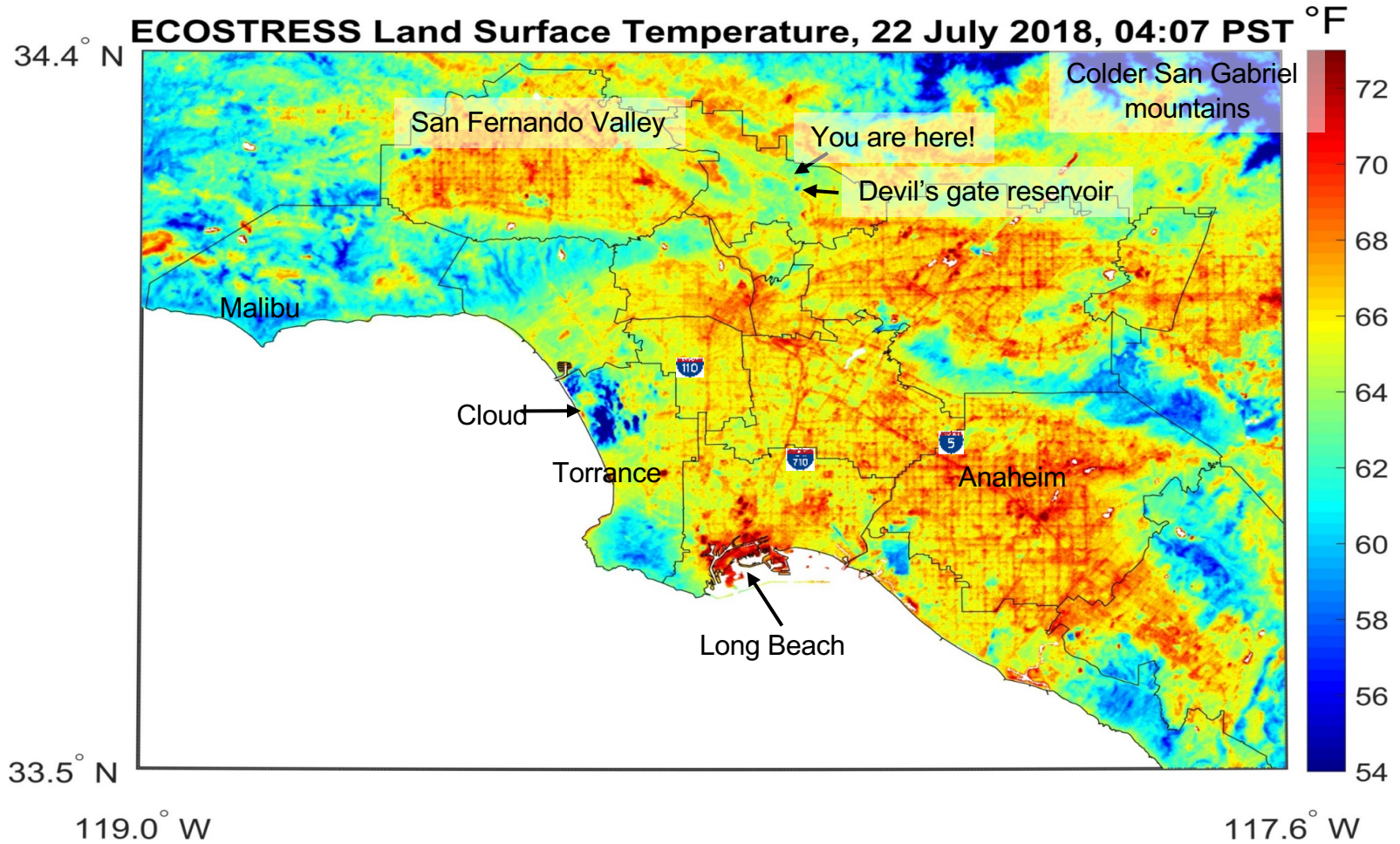
July 9th, 2018



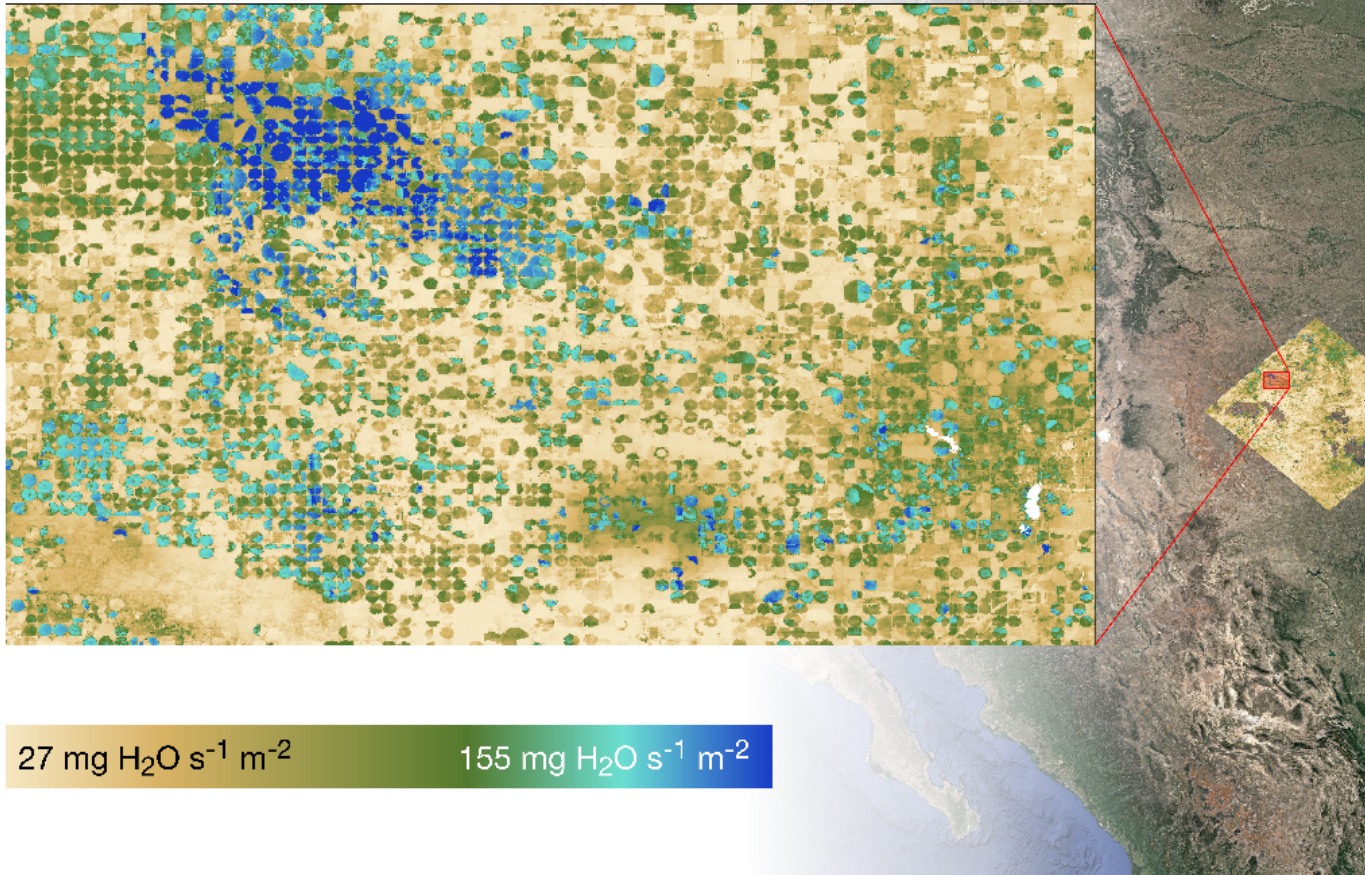


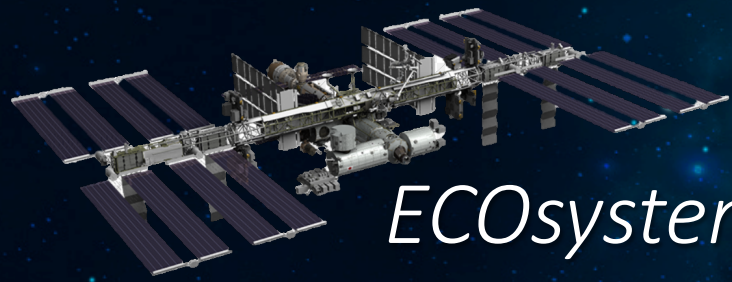
Fires in California, July 29th





ECOSTRESS L3 (ET PT-JPL) 2018-07-29 18:19 CDT

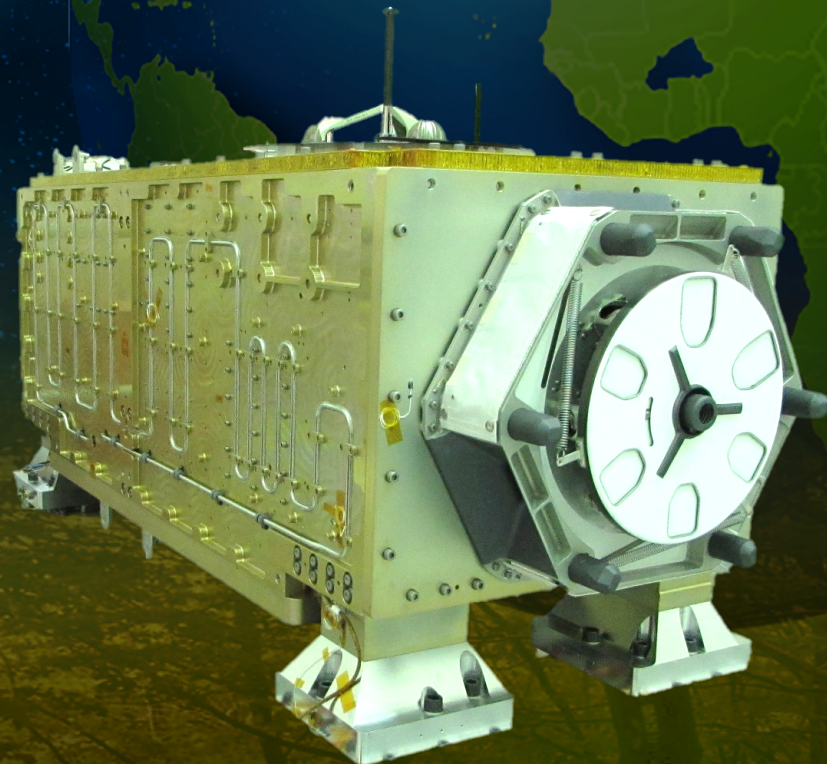




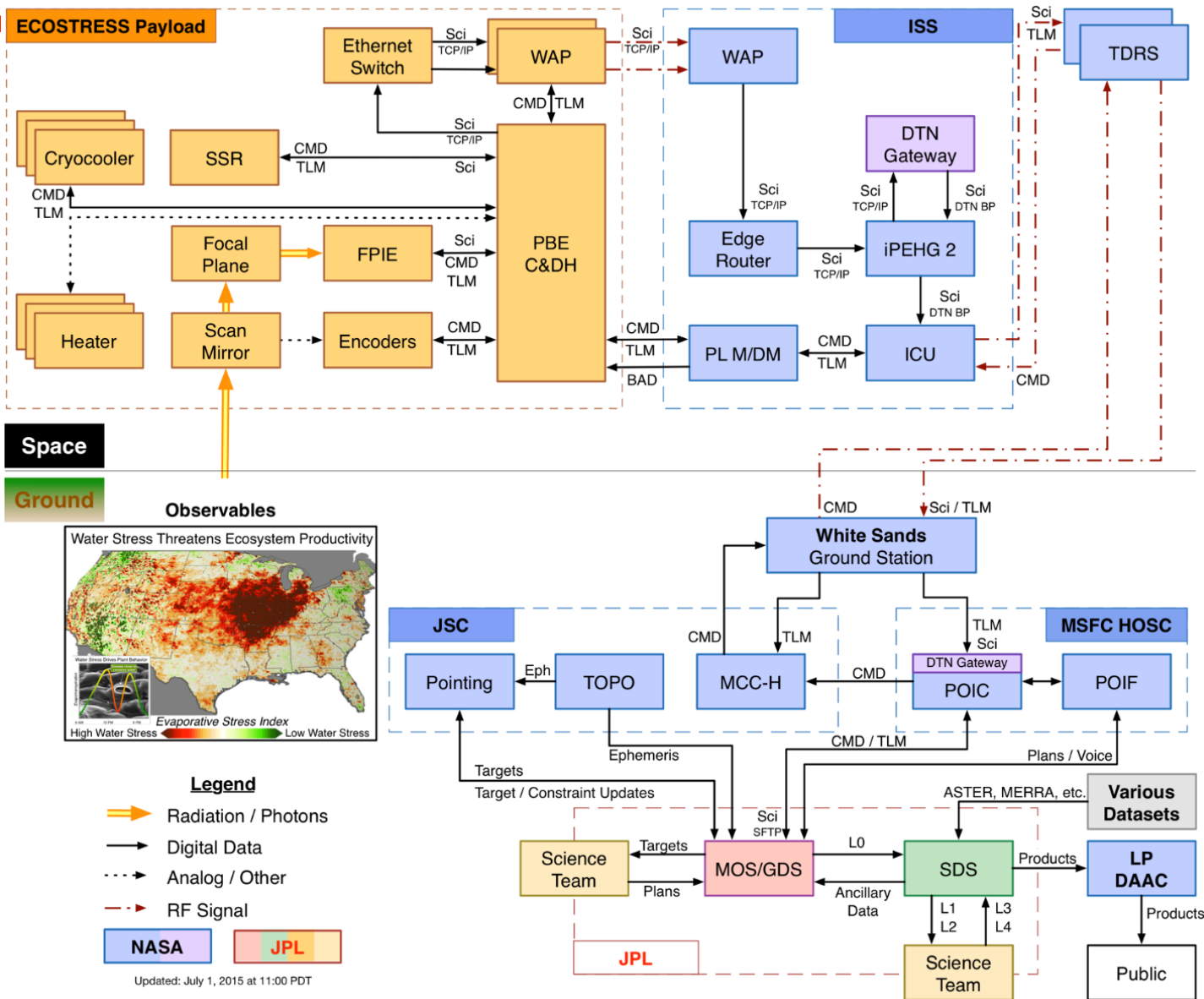
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Mission Operations

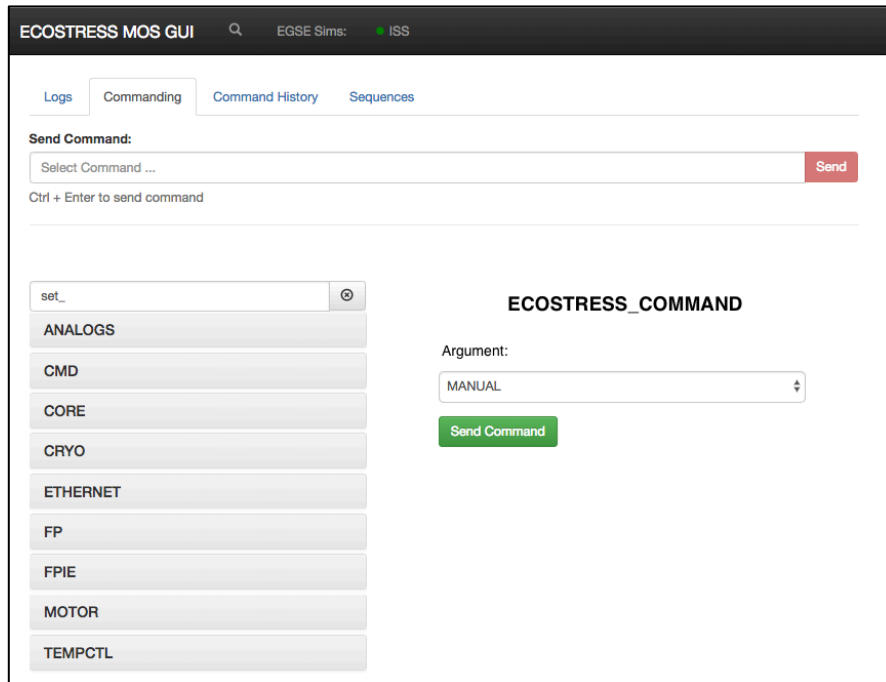


End-to-End Information System



“Lights Dim” Operations

- Weekly Science Planning Process
 - On *Tuesday*, **generate** ~14-days of sequences based on TOPO predicts [1]
 - On *Wednesday*, **uplink** from ECOSTRESS GDS [2] and **enable** onboard
 - On *Thursday*, new set of sequences begins



[1] Adaptation of AMMOS Instrument Toolkit

<https://github.com/NASA-AMMOS/AIT-Core>

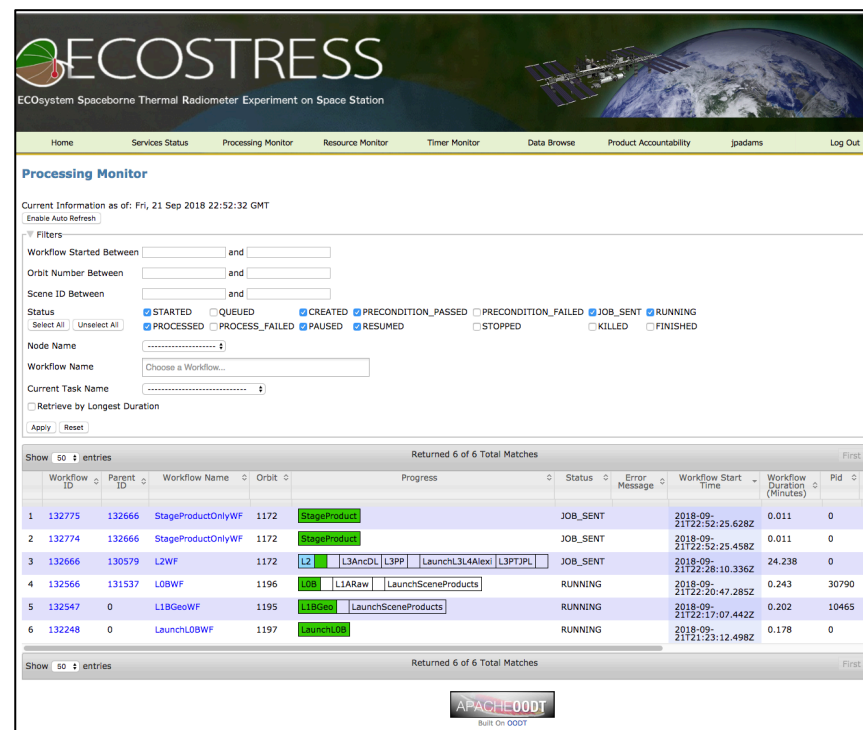
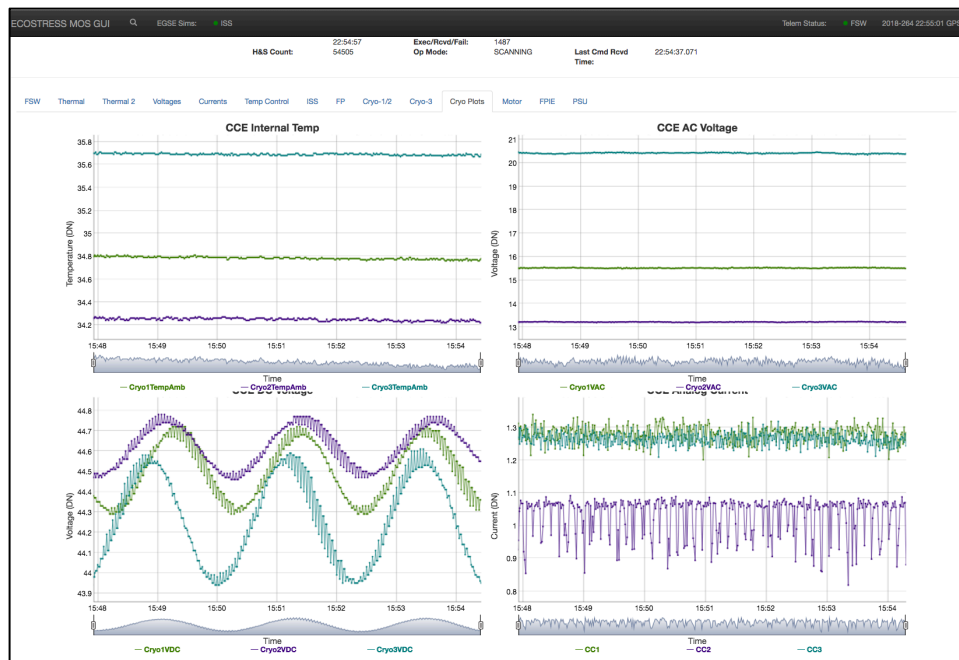
<https://github.com/NASA-AMMOS/AIT-GUI>

[2] Planned observations from Google Earth

Nominal Operations Downlink

“Lights Dim” Operations

- Continuous science data downlink via DTN
- Automated monitoring at JPL Mission Control through ECOSTRESS GDS [1]
- Safety critical monitoring defined in Payload Regs / Flight Rules
- Automated processing of science data through Science Data System [2]



[1] Adaptation of AMMOS Instrument Toolkit

<https://github.com/NASA-AMMOS/AIT-Core>

<https://github.com/NASA-AMMOS/AIT-GUI>

[2] SDS Process Control System



Questions?



Backup